# ASSIGNMENT 2 : CS432

# REPORT

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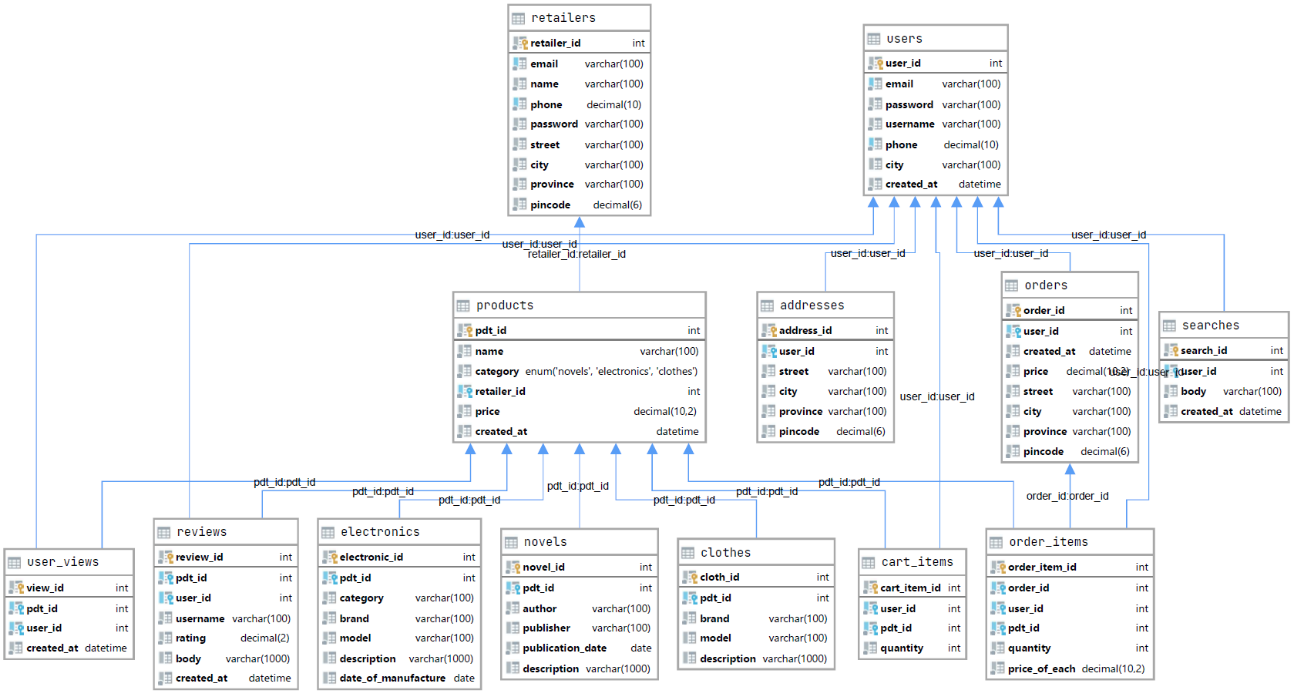
## Directory Structure

```
./
├── 01.sql      #the query files for each question numbered from 01 to 21
├── 02.sql
├── 03.sql
├── 04.sql
├── 05.sql
├── 06.sql
├── 07.sql
├── 08.sql
├── 09.sql
├── 10.sql
├── 11.sql
├── 12.sql
├── 13.sql
├── 14.sql
├── 15.sql
├── 16.sql
├── 17.sql
├── 18.sql
├── 19.sql
├── 20.sql
├── 21.sql
├── database_schema.pdf # the Database Schema as generated by Jetbrains
DataGrip toop
├── filled-dbdump.sql   #Database Instance with tables filled with dummy
records
├── images  #images of the output of queries and database schema
├── initial-dbdump.sql  #Database Instance with empty tables
├── report.md       # the report in MD format, same was converted to PDF
form report.pdf
├── report.pdf      # the PDF of the report
└── schema.sql     #contains the definition of the tables in the database
```

## Instructions

- Run `source schema.sql` to initialize a database named 'x' and tables inside it of users, products, etc.
- Run ``source 01.sql``` to fill the tables with dummy records.

# Database Schema



[Generated using JetBrains DataGrip]

- The attributes with blue table sign in front of their name are UNIQUE.
- The Blue Key represents FOREIGN KEY and Gold Key as PRIMARY KEY.

**For more detailed Database Schema refer to `schema.sql` file**

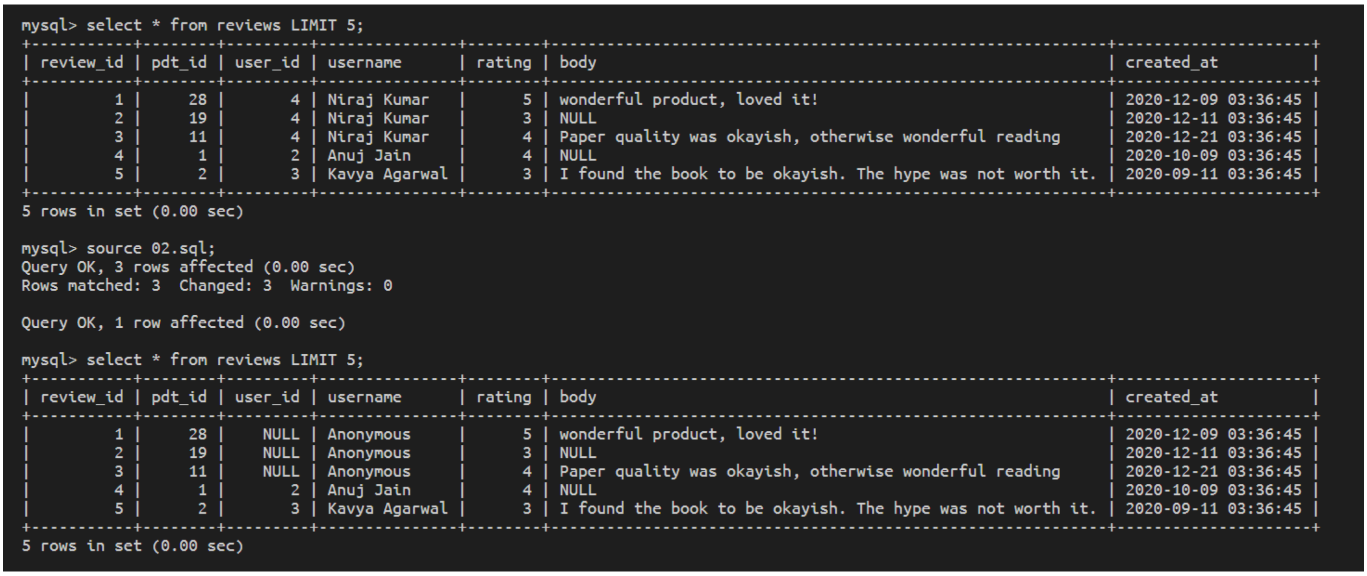
# Question 1.

**Refer to file `01.sql`**

# Question 2.

Here I deleted a user with email 'niraj@gmail.com'. I have set `ON DELETE CASCADE` for majority of Foreign Keys. In reviews relation, the user_id Foreign Key is allowed to be NULL.

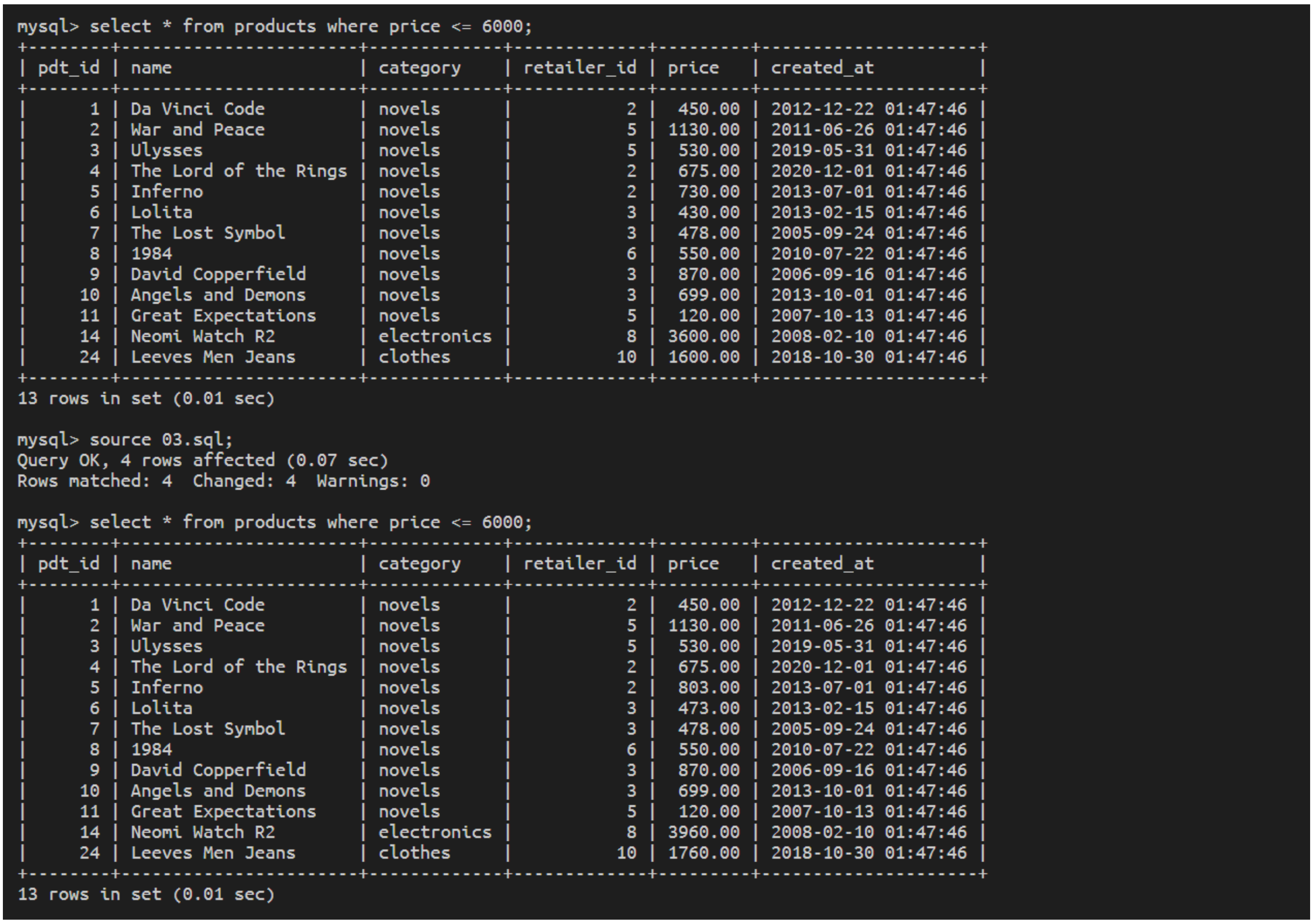
```
UPDATE reviews
SET user_id = NULL, username = 'Anonymous'
WHERE user_id = (SELECT user_id
    FROM users
    WHERE email = 'niraj@gmail.com');

DELETE FROM users
WHERE email = 'niraj@gmail.com';
```



```
mysql> select * from reviews LIMIT 5;
+-----------+--------+---------+---------------+--------+------------------------------------------------------------+---------------------+
| review_id | pdt_id | user_id | username      | rating | body                                                       | created_at          |
+-----------+--------+---------+---------------+--------+------------------------------------------------------------+---------------------+
|         1 |     28 |       4 | Niraj Kumar   |      5 | wonderful product, loved it!                               | 2020-12-09 03:36:45 |
|         2 |     19 |       4 | Niraj Kumar   |      3 | NULL                                                       | 2020-12-11 03:36:45 |
|         3 |     11 |       4 | Niraj Kumar   |      4 | Paper quality was okayish, otherwise wonderful reading     | 2020-12-21 03:36:45 |
|         4 |      1 |       2 | Anuj Jain     |      4 | NULL                                                       | 2020-10-09 03:36:45 |
|         5 |      2 |       3 | Kavya Agarwal |      3 | I found the book to be okayish. The hype was not worth it. | 2020-09-11 03:36:45 |
+-----------+--------+---------+---------------+--------+------------------------------------------------------------+---------------------+
5 rows in set (0.00 sec)

mysql> source 02.sql;
Query OK, 3 rows affected (0.00 sec)
Rows matched: 3  Changed: 3  Warnings: 0

Query OK, 1 row affected (0.00 sec)

mysql> select * from reviews LIMIT 5;
+-----------+--------+---------+---------------+--------+------------------------------------------------------------+---------------------+
| review_id | pdt_id | user_id | username      | rating | body                                                       | created_at          |
+-----------+--------+---------+---------------+--------+------------------------------------------------------------+---------------------+
|         1 |     28 |    NULL | Anonymous     |      5 | wonderful product, loved it!                               | 2020-12-09 03:36:45 |
|         2 |     19 |    NULL | Anonymous     |      3 | NULL                                                       | 2020-12-11 03:36:45 |
|         3 |     11 |    NULL | Anonymous     |      4 | Paper quality was okayish, otherwise wonderful reading     | 2020-12-21 03:36:45 |
|         4 |      1 |       2 | Anuj Jain     |      4 | NULL                                                       | 2020-10-09 03:36:45 |
|         5 |      2 |       3 | Kavya Agarwal |      3 | I found the book to be okayish. The hype was not worth it. | 2020-09-11 03:36:45 |
+-----------+--------+---------+---------------+--------+------------------------------------------------------------+---------------------+
5 rows in set (0.00 sec)
```

## Question 3.

```
UPDATE products
SET price = price * 1.10
where price < 5000 AND pdt_id IN (
    SELECT pdt_id
    FROM user_views
    WHERE created_at >= DATE_SUB(CURDATE(),INTERVAL 3 MONTH)
    GROUP BY pdt_id
    HAVING COUNT(DISTINCT user_id) > 10
);
```

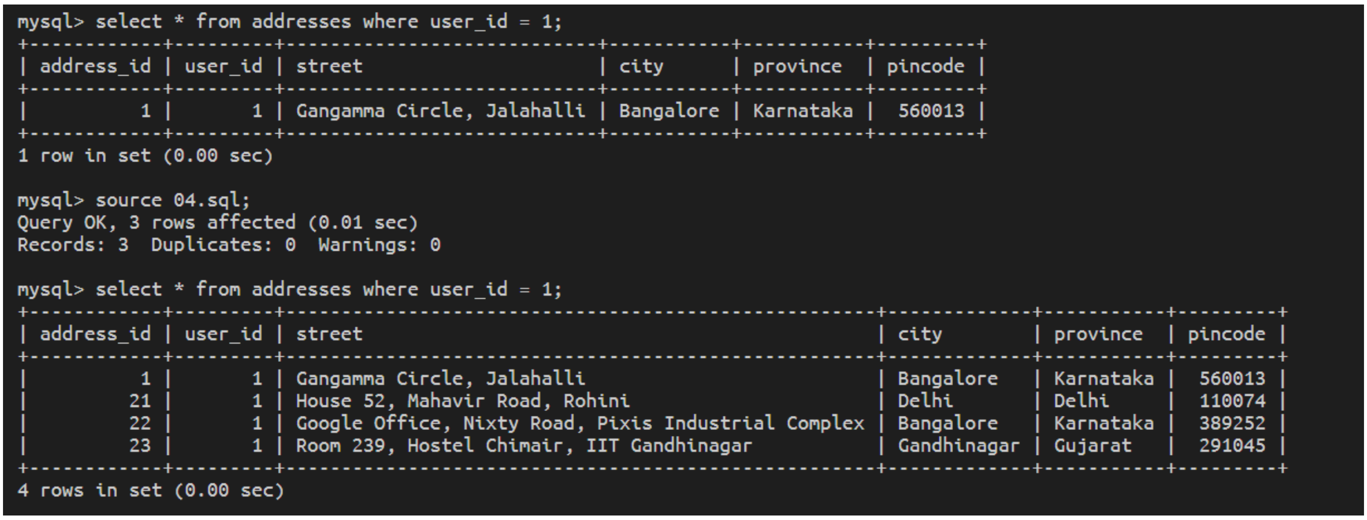


```
mysql> select * from products where price <= 6000;
+--------+-----------------------+-------------+-------------+---------+---------------------+
| pdt_id | name                  | category    | retailer_id | price   | created_at          |
+--------+-----------------------+-------------+-------------+---------+---------------------+
|      1 | Da Vinci Code         | novels      |           2 |  450.00 | 2012-12-22 01:47:46 |
|      2 | War and Peace         | novels      |           5 | 1130.00 | 2011-06-26 01:47:46 |
|      3 | Ulysses               | novels      |           5 |  530.00 | 2019-05-31 01:47:46 |
|      4 | The Lord of the Rings | novels      |           2 |  675.00 | 2020-12-01 01:47:46 |
|      5 | Inferno               | novels      |           2 |  730.00 | 2013-07-01 01:47:46 |
|      6 | Lolita                | novels      |           3 |  430.00 | 2013-02-15 01:47:46 |
|      7 | The Lost Symbol       | novels      |           3 |  478.00 | 2005-09-24 01:47:46 |
|      8 | 1984                  | novels      |           6 |  550.00 | 2010-07-22 01:47:46 |
|      9 | David Copperfield     | novels      |           3 |  870.00 | 2006-09-16 01:47:46 |
|     10 | Angels and Demons     | novels      |           3 |  699.00 | 2013-10-01 01:47:46 |
|     11 | Great Expectations    | novels      |           5 |  120.00 | 2007-10-13 01:47:46 |
|     14 | Neomi Watch R2        | electronics |           8 | 3600.00 | 2008-02-10 01:47:46 |
|     24 | Leeves Men Jeans      | clothes     |          10 | 1600.00 | 2018-10-30 01:47:46 |
+--------+-----------------------+-------------+-------------+---------+---------------------+
13 rows in set (0.01 sec)

mysql> source 03.sql;
Query OK, 4 rows affected (0.07 sec)
Rows matched: 4  Changed: 4  Warnings: 0

mysql> select * from products where price <= 6000;
+--------+-----------------------+-------------+-------------+---------+---------------------+
| pdt_id | name                  | category    | retailer_id | price   | created_at          |
+--------+-----------------------+-------------+-------------+---------+---------------------+
|      1 | Da Vinci Code         | novels      |           2 |  450.00 | 2012-12-22 01:47:46 |
|      2 | War and Peace         | novels      |           5 | 1130.00 | 2011-06-26 01:47:46 |
|      3 | Ulysses               | novels      |           5 |  530.00 | 2019-05-31 01:47:46 |
|      4 | The Lord of the Rings | novels      |           2 |  675.00 | 2020-12-01 01:47:46 |
|      5 | Inferno               | novels      |           2 |  803.00 | 2013-07-01 01:47:46 |
|      6 | Lolita                | novels      |           3 |  473.00 | 2013-02-15 01:47:46 |
|      7 | The Lost Symbol       | novels      |           3 |  478.00 | 2005-09-24 01:47:46 |
|      8 | 1984                  | novels      |           6 |  550.00 | 2010-07-22 01:47:46 |
|      9 | David Copperfield     | novels      |           3 |  870.00 | 2006-09-16 01:47:46 |
|     10 | Angels and Demons     | novels      |           3 |  699.00 | 2013-10-01 01:47:46 |
|     11 | Great Expectations    | novels      |           5 |  120.00 | 2007-10-13 01:47:46 |
|     14 | Neomi Watch R2        | electronics |           8 | 3960.00 | 2008-02-10 01:47:46 |
|     24 | Leeves Men Jeans      | clothes     |          10 | 1760.00 | 2018-10-30 01:47:46 |
+--------+-----------------------+-------------+-------------+---------+---------------------+
13 rows in set (0.01 sec)
```

Here the prices of 5. Inferno, 6. Lolita, 9. David Copperfield, 14. Neomi Watch R2 and 24. Leeves Men Jeans have changed.

# Question 4.

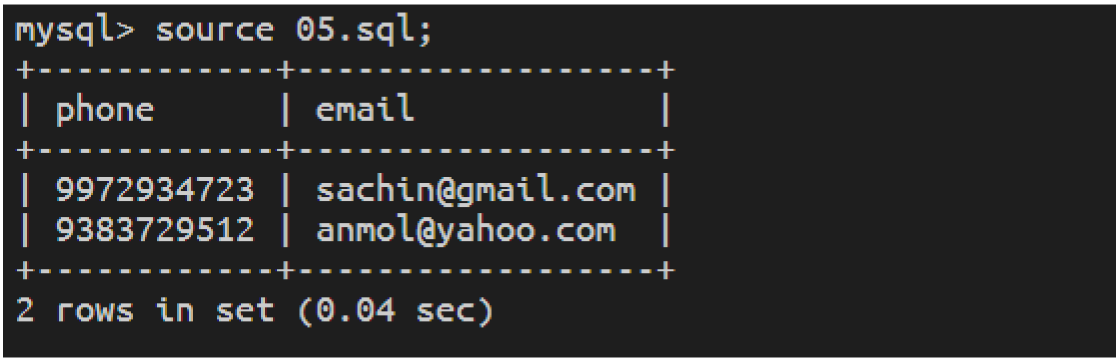
```
INSERT INTO addresses (user_id, street, city, province, pincode) VALUES
(1, 'House 52, Mahavir Road, Rohini', 'Delhi', 'Delhi', 110074),
(1, 'Google Office, Nixty Road, Pixis Industrial Complex', 'Bangalore',
'Karnataka', 389252),
(1, 'Room 239, Hostel Chimair, IIT Gandhinagar', 'Gandhinagar', 'Gujarat',
291045);
```



```
mysql> select * from addresses where user_id = 1;
+------------+---------+----------------------------+-----------+-----------+---------+
| address_id | user_id | street                     | city      | province  | pincode |
+------------+---------+----------------------------+-----------+-----------+---------+
|          1 |       1 | Gangamma Circle, Jalahalli | Bangalore | Karnataka |  560013 |
+------------+---------+----------------------------+-----------+-----------+---------+
1 row in set (0.00 sec)

mysql> source 04.sql;
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from addresses where user_id = 1;
+------------+---------+-----------------------------------------------------+-------------+-----------+---------+
| address_id | user_id | street                                              | city        | province  | pincode |
+------------+---------+-----------------------------------------------------+-------------+-----------+---------+
|          1 |       1 | Gangamma Circle, Jalahalli                          | Bangalore   | Karnataka |  560013 |
|         21 |       1 | House 52, Mahavir Road, Rohini                      | Delhi       | Delhi     |  110074 |
|         22 |       1 | Google Office, Nixty Road, Pixis Industrial Complex | Bangalore   | Karnataka |  389252 |
|         23 |       1 | Room 239, Hostel Chimair, IIT Gandhinagar           | Gandhinagar | Gujarat   |  291045 |
+------------+---------+-----------------------------------------------------+-------------+-----------+---------+
4 rows in set (0.00 sec)
```

# Question 5.

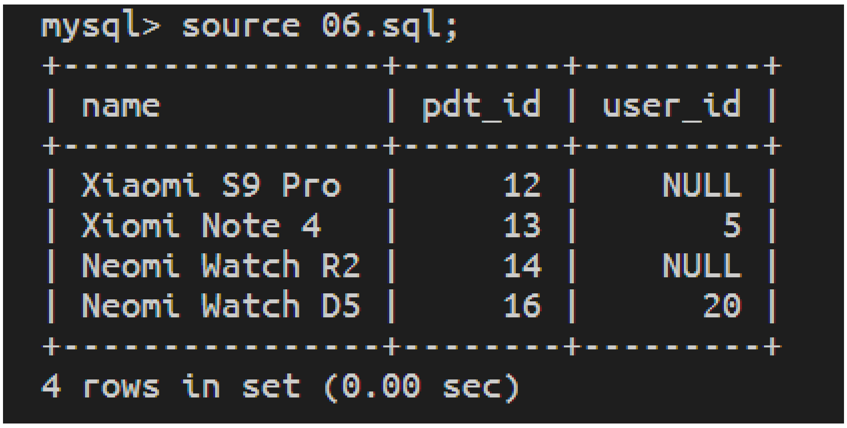
```sql
SELECT DISTINCT phone, email
FROM users
where city = 'Madrid' AND user_id IN (
    SELECT user_id
    FROM orders
    GROUP BY user_id
    HAVING SUM(price) >= 10000
);
```



```
mysql> source 05.sql;
+------------+-------------------+
| phone      | email             |
+------------+-------------------+
| 9972934723 | sachin@gmail.com  |
| 9383729512 | anmol@yahoo.com   |
+------------+-------------------+
2 rows in set (0.04 sec)
```

# Question 6.

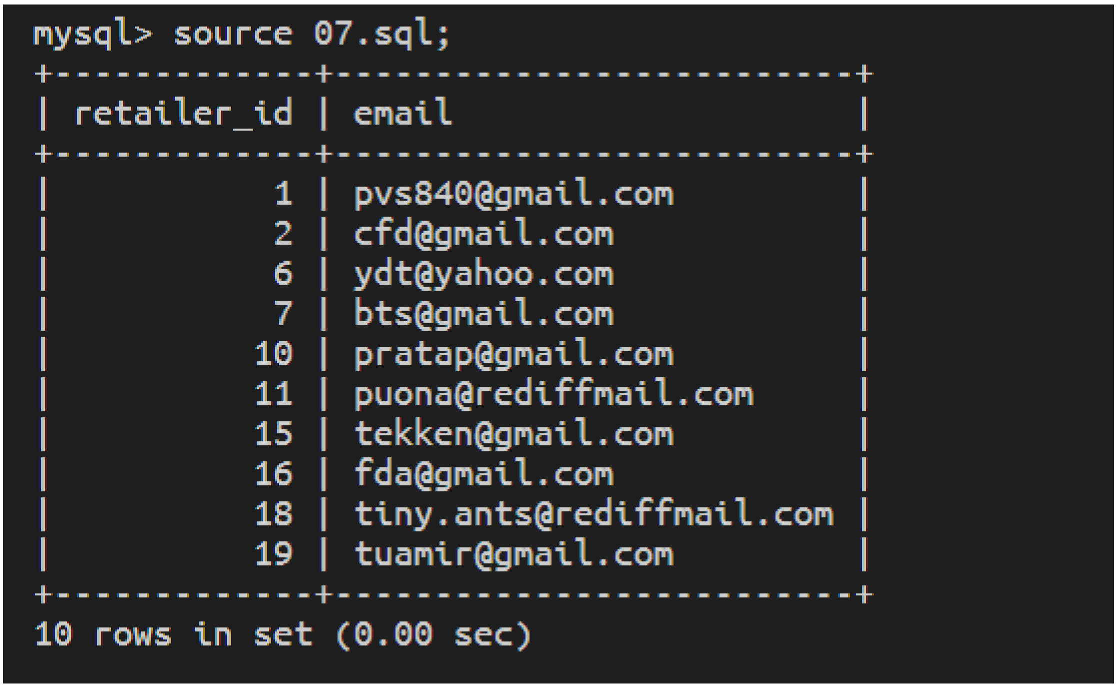
```sql
SELECT name, pdt_id, user_id
FROM (
    SELECT name, pdt_id
    FROM products
    WHERE name LIKE '%mi%'
)P LEFT OUTER JOIN (
    SELECT DISTINCT user_id, pdt_id
    FROM order_items
)O USING (pdt_id);
```



```
mysql> source 06.sql;
+----------------+--------+---------+
| name           | pdt_id | user_id |
+----------------+--------+---------+
| Xiaomi S9 Pro  |     12 |    NULL |
| Xiomi Note 4   |     13 |       5 |
| Neomi Watch R2 |     14 |    NULL |
| Neomi Watch D5 |     16 |      20 |
+----------------+--------+---------+
4 rows in set (0.00 sec)
```

## Question 7.

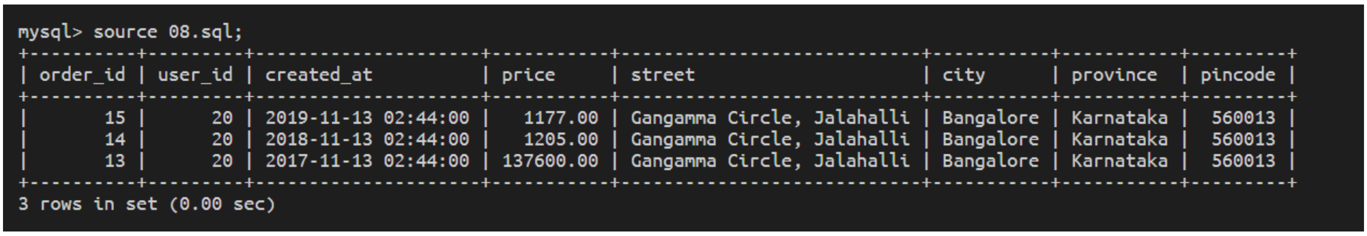
```
SELECT retailer_id, email
FROM retailers
WHERE city = 'Ahmedabad';
```



```
mysql> source 07.sql;
+-------------+--------------------------+
| retailer_id | email                    |
+-------------+--------------------------+
|           1 | pvs840@gmail.com         |
|           2 | cfd@gmail.com            |
|           6 | ydt@yahoo.com            |
|           7 | bts@gmail.com            |
|          10 | pratap@gmail.com         |
|          11 | puona@rediffmail.com     |
|          15 | tekken@gmail.com         |
|          16 | fda@gmail.com            |
|          18 | tiny.ants@rediffmail.com |
|          19 | tuamir@gmail.com         |
+-------------+--------------------------+
10 rows in set (0.00 sec)
```

## Question 8.

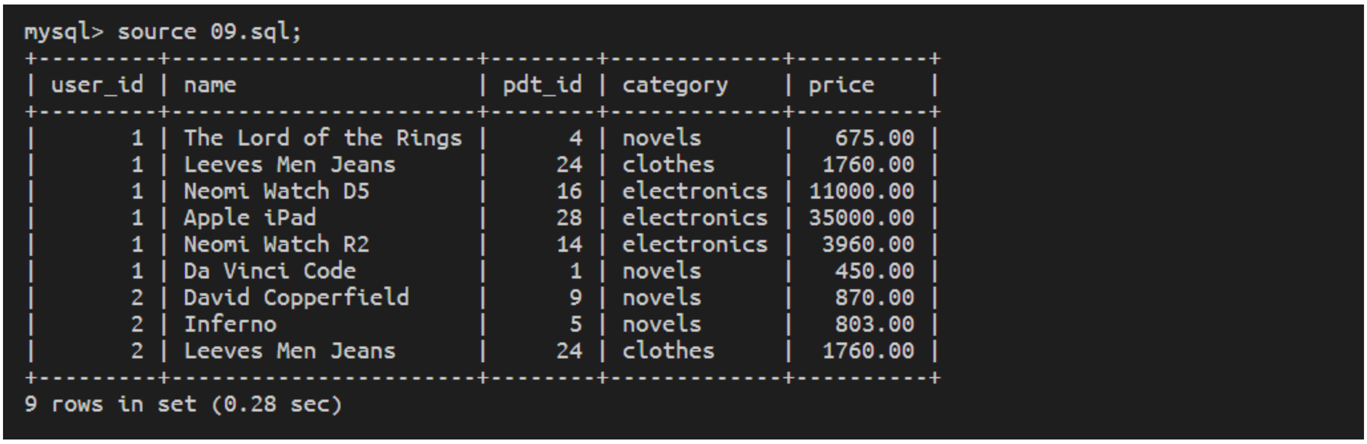
```
SELECT *
FROM orders
WHERE user_id = (
    SELECT user_id
    FROM users
    ORDER BY created_at DESC
    LIMIT 1)
ORDER BY created_at DESC
LIMIT 3;
```



```
mysql> source 08.sql;
+----------+---------+---------------------+-----------+---------------------------+-----------+-----------+---------+
| order_id | user_id | created_at          | price     | street                    | city      | province  | pincode |
+----------+---------+---------------------+-----------+---------------------------+-----------+-----------+---------+
|       15 |      20 | 2019-11-13 02:44:00 |   1177.00 | Gangamma Circle, Jalahalli | Bangalore | Karnataka |  560013 |
|       14 |      20 | 2018-11-13 02:44:00 |   1205.00 | Gangamma Circle, Jalahalli | Bangalore | Karnataka |  560013 |
|       13 |      20 | 2017-11-13 02:44:00 | 137600.00 | Gangamma Circle, Jalahalli | Bangalore | Karnataka |  560013 |
+----------+---------+---------------------+-----------+---------------------------+-----------+-----------+---------+
3 rows in set (0.00 sec)
```

# Question 9.

```
SELECT F.user_id, name, pdt_id, category, price
FROM products INNER JOIN (
    SELECT cart_items.user_id, pdt_id
    FROM cart_items INNER JOIN (
        SELECT user_id
        FROM users
        ORDER BY created_at ASC
        LIMIT 2
    ) U USING(user_id)
)F USING (pdt_id);
```

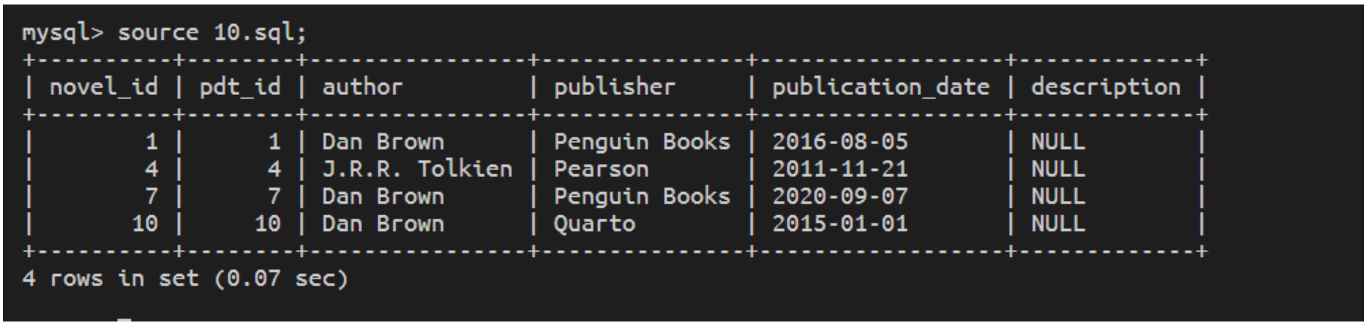


```
mysql> source 09.sql;
+---------+-----------------------+--------+-------------+----------+
| user_id | name                  | pdt_id | category    | price    |
+---------+-----------------------+--------+-------------+----------+
|       1 | The Lord of the Rings |      4 | novels      |   675.00 |
|       1 | Leeves Men Jeans      |     24 | clothes     |  1760.00 |
|       1 | Neomi Watch D5        |     16 | electronics | 11000.00 |
|       1 | Apple iPad            |     28 | electronics | 35000.00 |
|       1 | Neomi Watch R2        |     14 | electronics |  3960.00 |
|       1 | Da Vinci Code         |      1 | novels      |   450.00 |
|       2 | David Copperfield     |      9 | novels      |   870.00 |
|       2 | Inferno               |      5 | novels      |   803.00 |
|       2 | Leeves Men Jeans      |     24 | clothes     |  1760.00 |
+---------+-----------------------+--------+-------------+----------+
9 rows in set (0.28 sec)
```

# Question 10.

**Assumption**: By 'after 2010', we mean book published in 2011 (excluding 2010) and coming years.

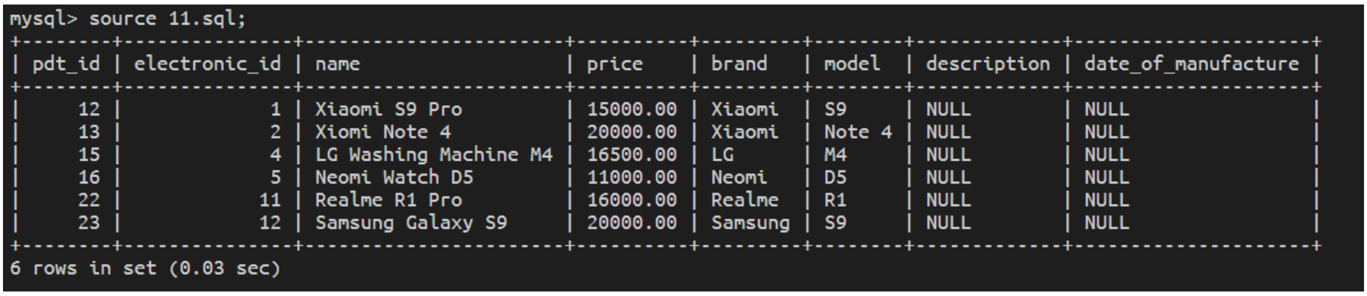
```
SELECT *
FROM novels
WHERE publication_date >= '2011-01-01';
```



```
mysql> source 10.sql;
+----------+--------+----------------+---------------+------------------+-------------+
| novel_id | pdt_id | author         | publisher     | publication_date | description |
+----------+--------+----------------+---------------+------------------+-------------+
|        1 |      1 | Dan Brown      | Penguin Books | 2016-08-05       | NULL        |
|        4 |      4 | J.R.R. Tolkien | Pearson       | 2011-11-21       | NULL        |
|        7 |      7 | Dan Brown      | Penguin Books | 2020-09-07       | NULL        |
|       10 |     10 | Dan Brown      | Quarto        | 2015-01-01       | NULL        |
+----------+--------+----------------+---------------+------------------+-------------+
4 rows in set (0.07 sec)
```

# Question 11.

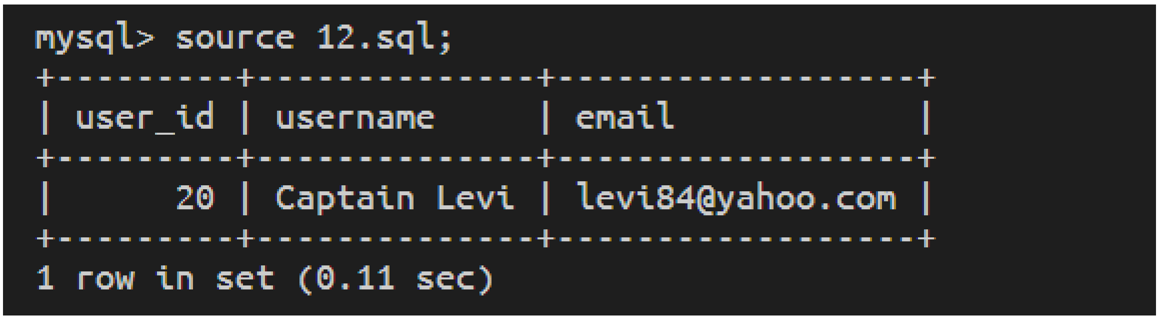
```
SELECT pdt_id, e.electronic_id, p.name, price, brand, model, description,
date_of_manufacture
FROM electronics e JOIN products p USING(pdt_id)
WHERE price BETWEEN 10000 AND 20000;
```



```
mysql> source 11.sql;
+--------+---------------+-----------------------+----------+----------+--------+-------------+---------------------+
| pdt_id | electronic_id | name                  | price    | brand    | model  | description | date_of_manufacture |
+--------+---------------+-----------------------+----------+----------+--------+-------------+---------------------+
|     12 |             1 | Xiaomi S9 Pro         | 15000.00 | Xiaomi   | S9     | NULL        | NULL                |
|     13 |             2 | Xiomi Note 4          | 20000.00 | Xiaomi   | Note 4 | NULL        | NULL                |
|     15 |             4 | LG Washing Machine M4 | 16500.00 | LG       | M4     | NULL        | NULL                |
|     16 |             5 | Neomi Watch D5        | 11000.00 | Neomi    | D5     | NULL        | NULL                |
|     22 |            11 | Realme R1 Pro         | 16000.00 | Realme   | R1     | NULL        | NULL                |
|     23 |            12 | Samsung Galaxy S9     | 20000.00 | Samsung  | S9     | NULL        | NULL                |
+--------+---------------+-----------------------+----------+----------+--------+-------------+---------------------+
6 rows in set (0.03 sec)
```

# Question 12.

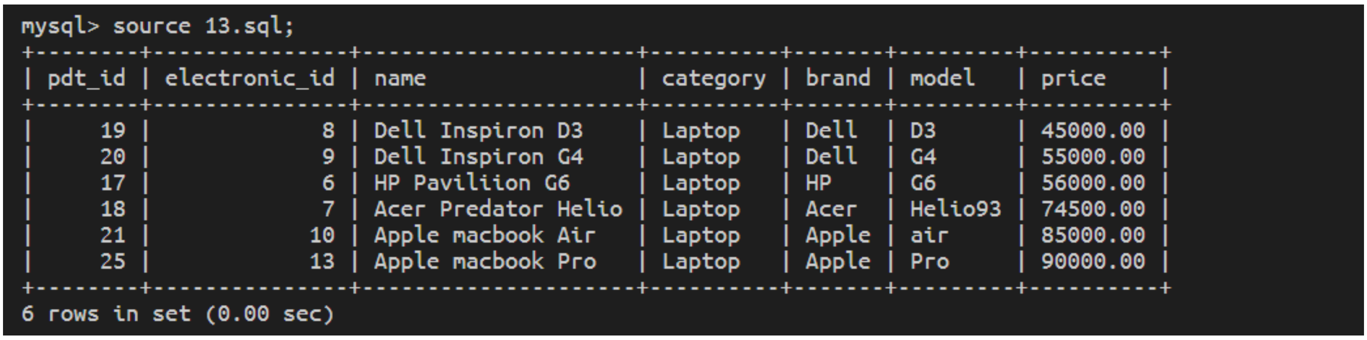
```
SELECT user_id, username, email
FROM
    (SELECT user_id
    FROM order_items INNER JOIN products USING (pdt_id)
    WHERE category = "electronics"
    GROUP BY user_id
    HAVING SUM(quantity) > 3) A
INNER JOIN
    (SELECT user_id
    FROM order_items INNER JOIN products USING (pdt_id)
    WHERE category = "novels"
    GROUP BY user_id
    HAVING SUM(quantity) > 3) B
USING (user_id) JOIN users USING (user_id);
```



```
mysql> source 12.sql;
+---------+--------------+------------------+
| user_id | username     | email            |
+---------+--------------+------------------+
|      20 | Captain Levi | levi84@yahoo.com |
+---------+--------------+------------------+
1 row in set (0.11 sec)
```

## Question 13.

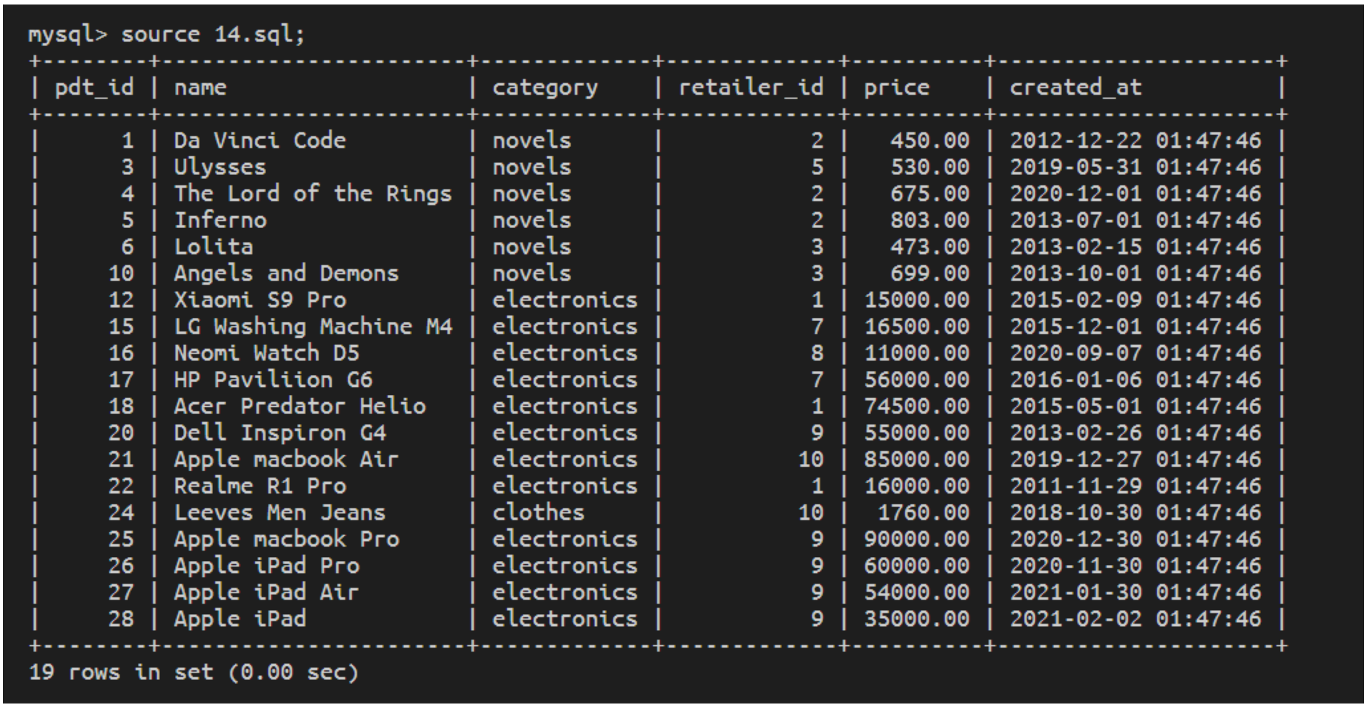
```
SELECT pdt_id, electronic_id, name, electronics.category,
electronics.brand, electronics.model, price
FROM electronics JOIN products USING (pdt_id)
WHERE electronics.pdt_id = products.pdt_id AND electronics.category =
"Laptop"
ORDER BY price ASC;
```



```
mysql> source 13.sql;
+--------+---------------+--------------------+----------+-------+---------+----------+
| pdt_id | electronic_id | name               | category | brand | model   | price    |
+--------+---------------+--------------------+----------+-------+---------+----------+
|     19 |             8 | Dell Inspiron D3   | Laptop   | Dell  | D3      | 45000.00 |
|     20 |             9 | Dell Inspiron G4   | Laptop   | Dell  | G4      | 55000.00 |
|     17 |             6 | HP Pavilion G6     | Laptop   | HP    | G6      | 56000.00 |
|     18 |             7 | Acer Predator Helio | Laptop  | Acer  | Helio93 | 74500.00 |
|     21 |            10 | Apple macbook Air  | Laptop   | Apple | air     | 85000.00 |
|     25 |            13 | Apple macbook Pro  | Laptop   | Apple | Pro     | 90000.00 |
+--------+---------------+--------------------+----------+-------+---------+----------+
6 rows in set (0.00 sec)
```

## Question 14.

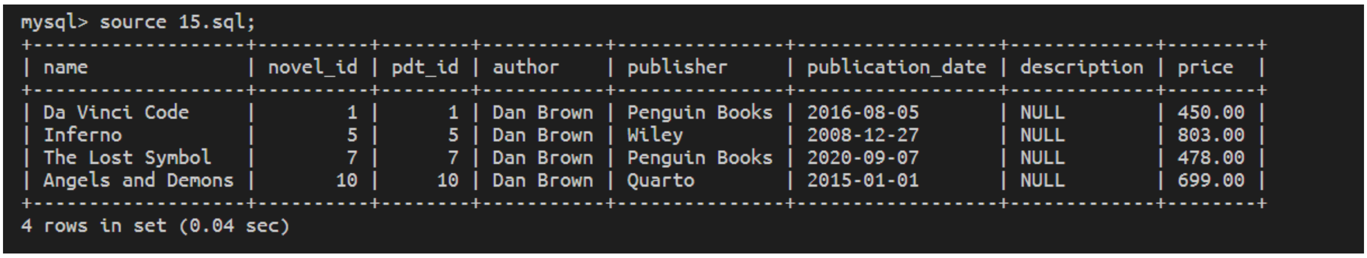
```
SELECT *
FROM products
WHERE created_at >= '2011-11-12 00:00:00';
```



```
mysql> source 14.sql;
+--------+-----------------------+-------------+-------------+----------+---------------------+
| pdt_id | name                  | category    | retailer_id | price    | created_at          |
+--------+-----------------------+-------------+-------------+----------+---------------------+
|      1 | Da Vinci Code         | novels      |           2 |   450.00 | 2012-12-22 01:47:46 |
|      3 | Ulysses               | novels      |           5 |   530.00 | 2019-05-31 01:47:46 |
|      4 | The Lord of the Rings | novels      |           2 |   675.00 | 2020-12-01 01:47:46 |
|      5 | Inferno               | novels      |           2 |   803.00 | 2013-07-01 01:47:46 |
|      6 | Lolita                | novels      |           3 |   473.00 | 2013-02-15 01:47:46 |
|     10 | Angels and Demons     | novels      |           3 |   699.00 | 2013-10-01 01:47:46 |
|     12 | Xiaomi S9 Pro         | electronics |           1 | 15000.00 | 2015-02-09 01:47:46 |
|     15 | LG Washing Machine M4 | electronics |           7 | 16500.00 | 2015-12-01 01:47:46 |
|     16 | Neomi Watch D5        | electronics |           8 | 11000.00 | 2020-09-07 01:47:46 |
|     17 | HP Paviliion G6       | electronics |           7 | 56000.00 | 2016-01-06 01:47:46 |
|     18 | Acer Predator Helio   | electronics |           1 | 74500.00 | 2015-05-01 01:47:46 |
|     20 | Dell Inspiron G4      | electronics |           9 | 55000.00 | 2013-02-26 01:47:46 |
|     21 | Apple macbook Air     | electronics |          10 | 85000.00 | 2019-12-27 01:47:46 |
|     22 | Realme R1 Pro         | electronics |           1 | 16000.00 | 2011-11-29 01:47:46 |
|     24 | Leeves Men Jeans      | clothes     |          10 |  1760.00 | 2018-10-30 01:47:46 |
|     25 | Apple macbook Pro     | electronics |           9 | 90000.00 | 2020-12-30 01:47:46 |
|     26 | Apple iPad Pro        | electronics |           9 | 60000.00 | 2020-11-30 01:47:46 |
|     27 | Apple iPad Air        | electronics |           9 | 54000.00 | 2021-01-30 01:47:46 |
|     28 | Apple iPad            | electronics |           9 | 35000.00 | 2021-02-02 01:47:46 |
+--------+-----------------------+-------------+-------------+----------+---------------------+
19 rows in set (0.00 sec)
```

## Question 15.

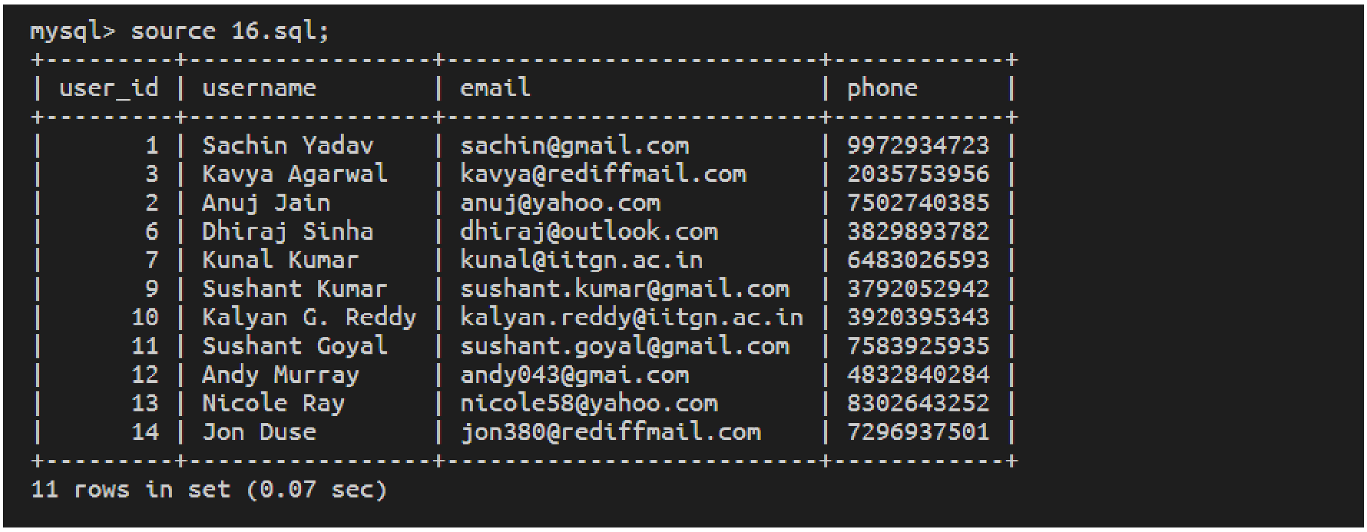
```
SELECT name, novels.*, price
FROM novels JOIN products using (pdt_id)
WHERE author = "Dan Brown";
```



```
mysql> source 15.sql;
+-------------------+----------+--------+-----------+---------------+------------------+-------------+--------+
| name              | novel_id | pdt_id | author    | publisher     | publication_date | description | price  |
+-------------------+----------+--------+-----------+---------------+------------------+-------------+--------+
| Da Vinci Code     |        1 |      1 | Dan Brown | Penguin Books | 2016-08-05       | NULL        | 450.00 |
| Inferno           |        5 |      5 | Dan Brown | Wiley         | 2008-12-27       | NULL        | 803.00 |
| The Lost Symbol   |        7 |      7 | Dan Brown | Penguin Books | 2020-09-07       | NULL        | 478.00 |
| Angels and Demons |       10 |     10 | Dan Brown | Quarto        | 2015-01-01       | NULL        | 699.00 |
+-------------------+----------+--------+-----------+---------------+------------------+-------------+--------+
4 rows in set (0.04 sec)
```

## Question 16.

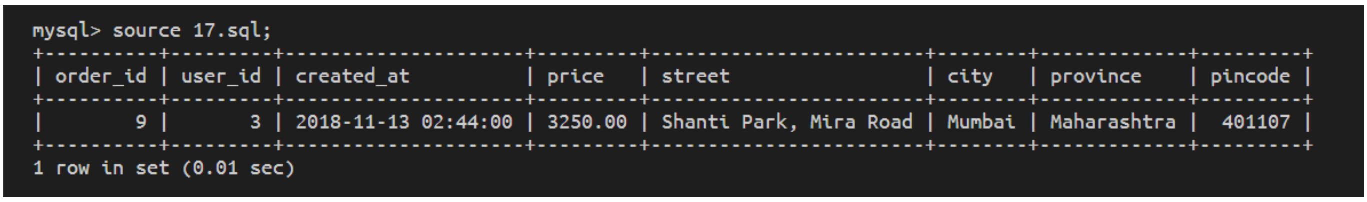
```
SELECT DISTINCT user_id, username, email, phone
FROM users
WHERE user_id in (
    SELECT user_id
    FROM cart_items
    WHERE quantity < 5
);
```



```
mysql> source 16.sql;
+---------+-----------------+--------------------------+------------+
| user_id | username        | email                    | phone      |
+---------+-----------------+--------------------------+------------+
|       1 | Sachin Yadav    | sachin@gmail.com         | 9972934723 |
|       3 | Kavya Agarwal   | kavya@rediffmail.com     | 2035753956 |
|       2 | Anuj Jain       | anuj@yahoo.com           | 7502740385 |
|       6 | Dhiraj Sinha    | dhiraj@outlook.com       | 3829893782 |
|       7 | Kunal Kumar     | kunal@iitgn.ac.in        | 6483026593 |
|       9 | Sushant Kumar   | sushant.kumar@gmail.com  | 3792052942 |
|      10 | Kalyan G. Reddy | kalyan.reddy@iitgn.ac.in | 3920395343 |
|      11 | Sushant Goyal   | sushant.goyal@gmail.com  | 7583925935 |
|      12 | Andy Murray     | andy043@gmai.com         | 4832840284 |
|      13 | Nicole Ray      | nicole58@yahoo.com       | 8302643252 |
|      14 | Jon Duse        | jon380@rediffmail.com    | 7296937501 |
+---------+-----------------+--------------------------+------------+
11 rows in set (0.07 sec)
```

## Question 17.

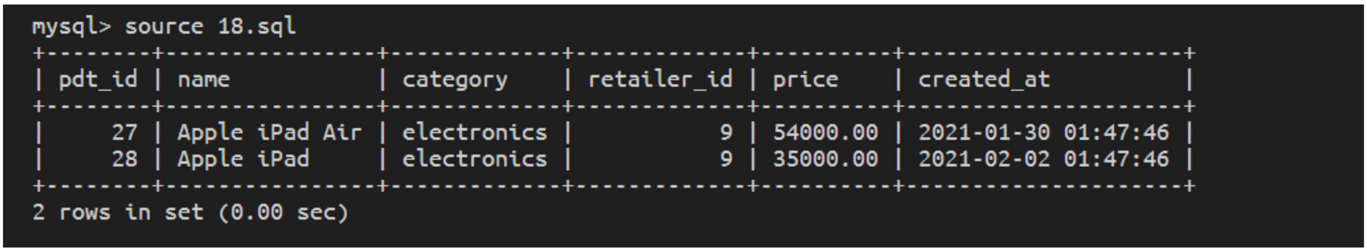
```
SELECT *
FROM orders
WHERE order_id = (
    SELECT order_id
    FROM order_items
    GROUP BY order_id
    ORDER BY SUM(quantity) DESC
    LIMIT 1);
```



```
mysql> source 17.sql;
+----------+---------+---------------------+---------+------------------------+--------+-------------+---------+
| order_id | user_id | created_at          | price   | street                 | city   | province    | pincode |
+----------+---------+---------------------+---------+------------------------+--------+-------------+---------+
|        9 |       3 | 2018-11-13 02:44:00 | 3250.00 | Shanti Park, Mira Road | Mumbai | Maharashtra |  401107 |
+----------+---------+---------------------+---------+------------------------+--------+-------------+---------+
1 row in set (0.01 sec)
```

## Question 18.

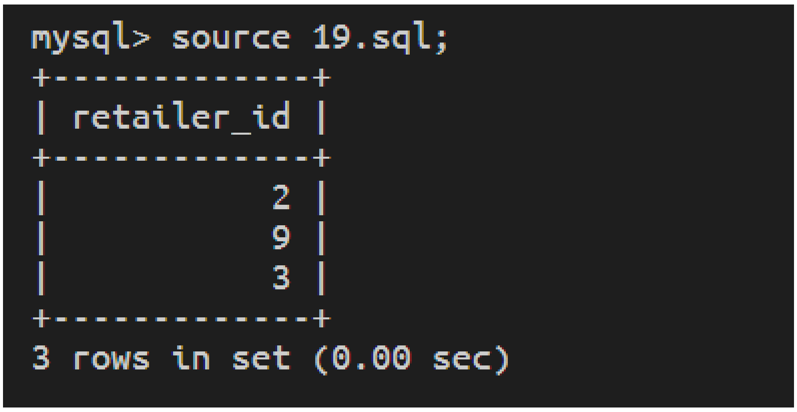
```
SELECT *
FROM products
WHERE created_at >= DATE_SUB(CURDATE(),INTERVAL 10 DAY);
```



```
mysql> source 18.sql
+--------+----------------+-------------+-------------+----------+---------------------+
| pdt_id | name           | category    | retailer_id | price    | created_at          |
+--------+----------------+-------------+-------------+----------+---------------------+
|     27 | Apple iPad Air | electronics |           9 | 54000.00 | 2021-01-30 01:47:46 |
|     28 | Apple iPad     | electronics |           9 | 35000.00 | 2021-02-02 01:47:46 |
+--------+----------------+-------------+-------------+----------+---------------------+
2 rows in set (0.00 sec)
```

## Question 19.

```
SELECT DISTINCT retailer_id
FROM products
WHERE pdt_id in (
    SELECT pdt_id
    FROM order_items
    WHERE user_id = 1
);
```

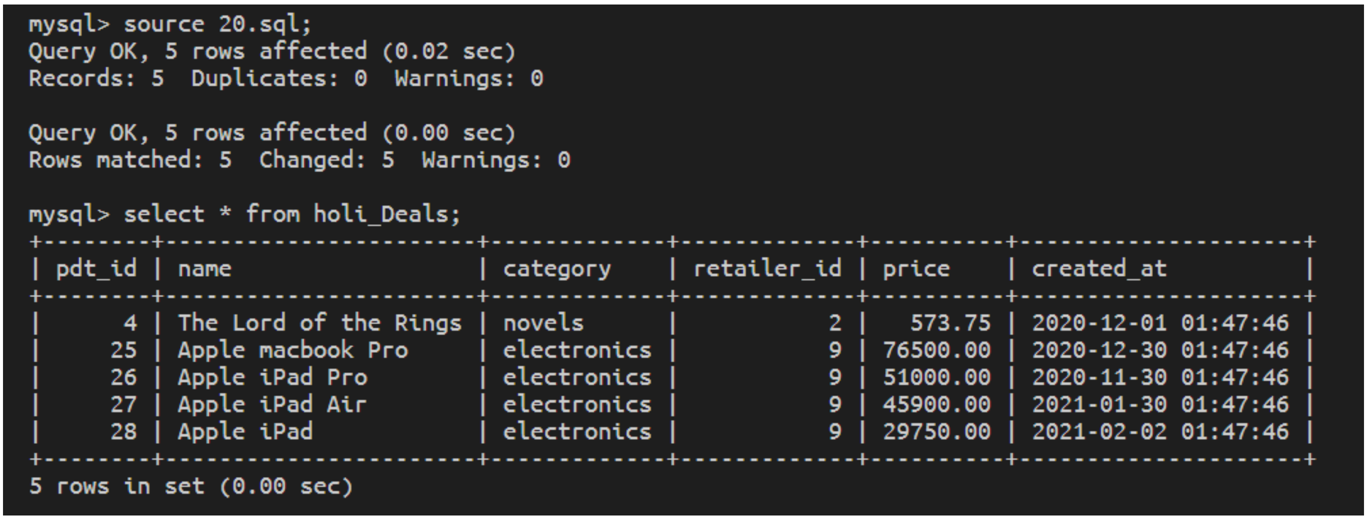


```
mysql> source 19.sql;
+-------------+
| retailer_id |
+-------------+
|           2 |
|           9 |
|           3 |
+-------------+
3 rows in set (0.00 sec)
```

## Question 20.

**Assumption:**: The prices in the original products tables will remain same. Only the prices in holi_Deals change.

```
CREATE TABLE holi_Deals
SELECT *
FROM products
WHERE created_at >= DATE_SUB(CURDATE(),INTERVAL 100 DAY);

UPDATE holi_Deals
SET price = price * 0.85;
```



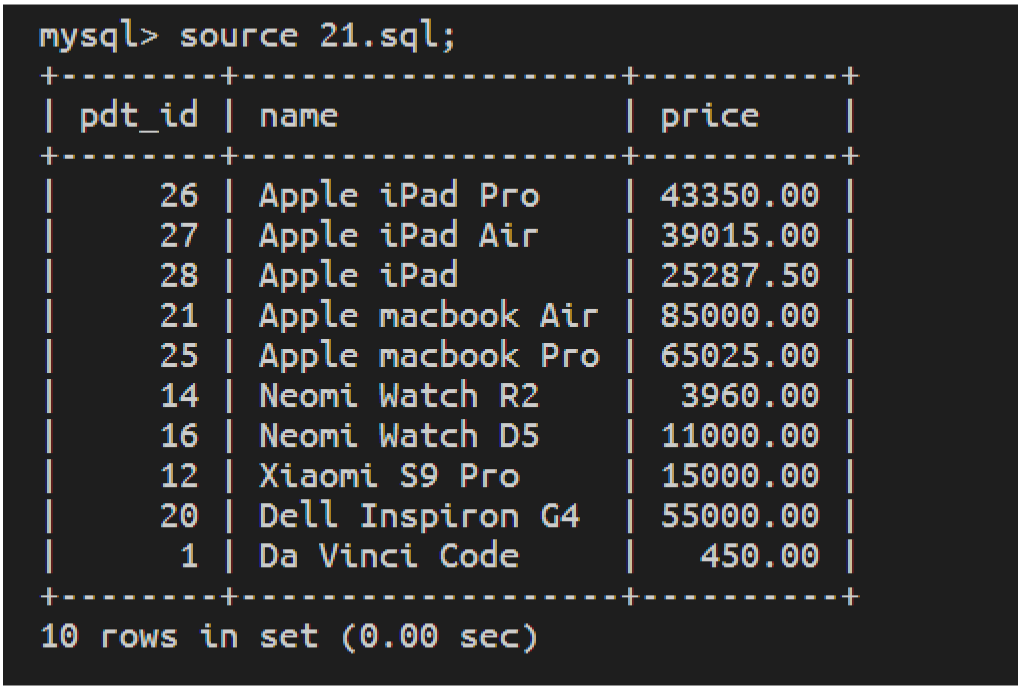
```
mysql> source 20.sql;
Query OK, 5 rows affected (0.02 sec)
Records: 5  Duplicates: 0  Warnings: 0

Query OK, 5 rows affected (0.00 sec)
Rows matched: 5  Changed: 5  Warnings: 0

mysql> select * from holi_Deals;
+--------+----------------------+-------------+-------------+----------+---------------------+
| pdt_id | name                 | category    | retailer_id | price    | created_at          |
+--------+----------------------+-------------+-------------+----------+---------------------+
|      4 | The Lord of the Rings | novels     |           2 |   573.75 | 2020-12-01 01:47:46 |
|     25 | Apple macbook Pro    | electronics |           9 | 76500.00 | 2020-12-30 01:47:46 |
|     26 | Apple iPad Pro       | electronics |           9 | 51000.00 | 2020-11-30 01:47:46 |
|     27 | Apple iPad Air       | electronics |           9 | 45900.00 | 2021-01-30 01:47:46 |
|     28 | Apple iPad           | electronics |           9 | 29750.00 | 2021-02-02 01:47:46 |
+--------+----------------------+-------------+-------------+----------+---------------------+
5 rows in set (0.00 sec)
```

## Question 21.

### About the recommendation algorithm

- Prepare a list of all the products that matches with the past searches of the user. [Descending Order of the time of search]
- Remove all the items from the above list, which the user has already bought after searching.
- Hence we are left with the products that are **similar to the previous searches/purchases but are not exactly the same product**.
- Here, I thought that a user have searched for a product and bought one. So I need not recommend the same product that he/she bought again, instead I show the other similar products to which his/her searchces matches.

```
SELECT pdt_id, name, price
FROM (
    SELECT user_id, searches.created_at, pdt_id
    FROM searches, products
    WHERE name LIKE CONCAT('%', body, '%')
) T INNER JOIN products USING(pdt_id)
WHERE T.user_id = 1 AND pdt_id NOT IN (
    SELECT pdt_id
    FROM order_items
    WHERE user_id = 1
)
GROUP BY pdt_id
ORDER BY MAX(T.created_at) DESC
LIMIT 10;
```



```
mysql> source 21.sql;
+--------+--------------------+----------+
| pdt_id | name               | price    |
+--------+--------------------+----------+
|     26 | Apple iPad Pro     | 43350.00 |
|     27 | Apple iPad Air     | 39015.00 |
|     28 | Apple iPad         | 25287.50 |
|     21 | Apple macbook Air  | 85000.00 |
|     25 | Apple macbook Pro  | 65025.00 |
|     14 | Neomi Watch R2     |  3960.00 |
|     16 | Neomi Watch D5     | 11000.00 |
|     12 | Xiaomi S9 Pro      | 15000.00 |
|     20 | Dell Inspiron G4   | 55000.00 |
|      1 | Da Vinci Code      |   450.00 |
+--------+--------------------+----------+
10 rows in set (0.00 sec)
```

**Explanation: (Dates given in Descending -- User 1)**

- Searched "iPad" on 26 Nov 2020.
- Searched "Apple" on 20 Nov 2020.

- Ordered "Lolita" on 10 Nov 2020.
- Searched "Lolita" on 1 November 2020.
- Searched "watch" on 20 Oct 2020.
- Searched "Xiaomi" on 15 Oct 2020.
- Ordered "Dell Inspiron D3" on 15 Oct 2020.
- Searched "Dell" on 20 Sept 2020.
- Searched "Xiaomi" on 12 Aug 2020.
- Ordered "Inferno" on 07 Jan 2010.
- Searched for "Inferno" on 06 Jan 2010.
- Searched for "Vinci Code" on 06 Jan 2010.